

CLAIMS

What is Claimed is:

1. A rail car cushioning device connected to a coupler, being switchable between a locked mode and a cushioning mode, comprising:
 - 5 a housing comprising a hydraulic cylinder, a front head, a rear head and a reservoir, the hydraulic cylinder extends between the front head and the rear head defining a chamber;
 - a piston, comprising a piston rod extending through the front head into the chamber and a piston head carried in the piston chamber, the piston being responsive to buff and draft impacts; and,
 - 10 a valve assembly in fluid communication with the cylinder including, a valve body having an inlet opening and an outlet opening defining a passageway, a valve member interposed in the passageway being movable between an open position and a closed position to control fluid flow through the passageway.
- 15 2. The cushioning device of claim 1 wherein in a cushioning mode, the valve is in an open position enabling fluid to communicate between the cylinder and reservoir via the valve assembly enabling the piston to stroke between a first and second position in the cylinder in response to buff and draft impacts on a coupler.
- 20 3. The cushioning device of claim 1 wherein in a locked mode, the valve is in a closed position, preventing fluid from flowing through the valve assembly, preventing the piston from stroking, forming a relatively rigid structure.
4. The cushioning device of claim 1 wherein the valve assembly further comprises a valve actuator for controlling movement of the valve member.
- 25 5. The cushioning device of claim 1 further comprising a controller in communication with the valve actuator for controlling the valve.

6. The cushion device of claim 5 wherein the controller processes an indicating signal and transmits a commanding signal to the valve actuator to open or close the valve.

5 7. The cushioning device of claim 5 wherein a proximity sensor detects the movement of an approaching car and sends an indicating signal to the controller

8. The cushioning device of claim 1 wherein the piston has a metering pin extending outwardly from the piston head towards the rear head and the rear head has an opening with an orifice disposed therein.

10 9. The cushioning device of claim 8 wherein the metering pin has a tapered cylindrical configuration adapted for engagement with the orifice.

10. The cushioning device of claim 9 wherein movement of the piston in a buff direction causes the metering pin to engage the orifice, thus continuously reducing the area of the orifice.

15 11. The cushioning device of claim 1 including a port extending through the piston head enabling fluid flow therethrough.

12. The cushioning device of claim 11 including an overload protection valve extending through the piston head.

20 13. The cushioning device of claim 1 wherein the piston head has a dynamic pressure seal connected to the outer surface of the piston head for preventing fluid from passing between the piston head and inner wall of the cylinder.

14. The cushioning device of claim 1 wherein the opening in the front head includes a rod seal disposed therein.

25 15. The cushioning device of claim 1 wherein the cylinder includes one or more ports located in the inner wall enabling fluid to flow between the cylinder and reservoir.

16. The cushioning device of claim 1 wherein the front head includes at least one channel extending between the reservoir and draft chamber enabling fluid to flow into the draft chamber during buff movement of the cylinder.

5 17. The cushioning device of claim 1 wherein the front head includes a channel extending from the upper portion of the reservoir and the draft chamber and a channel extending between the lower portion of the reservoir and the draft chamber.

18. The cushioning device of claim 1 wherein the cylinder includes at least one channel extending between the reservoir and draft chamber enabling fluid to flow into the draft chamber during buff movement of the cylinder.

10 19. The cushioning device of claim 1 wherein the cylinder includes a channel extending from the upper portion of the reservoir and the draft chamber and a channel extending between the lower portion of the reservoir and the draft chamber.

20. The cushioning device of claim 1 wherein in a locked mode, fluid flows between the reservoir and cylinder enabling the piston to return to a first
15 position.

21. The cushioning device of claim 1 wherein the controller receives a signal from the locomotive indicating impending train movement the controller sends a signal to the actuator switching the device into a locked mode.

22. The cushioning device of claim 1 including one or more ports
20 located in the inner wall proximate to the front head enabling fluid flow between the reservoir and the draft chamber.

23. The cushioning device of claim 1 including one or more ports located in the inner wall proximate to the rear head enabling fluid flow between the reservoir and the buff chamber, and a one-way check valve disposed in the port
25 enabling fluid to flow into the buff chamber from the reservoir during draft movement of the piston.

24. A rail car cushioning device being switchable between a locked mode and a cushioning mode, the cushioning device comprising:

a housing including a cylinder, front head and rear head, defining a hydraulic chamber and reservoir;

including a front head and rear head, the front head having an aperture adapted to receive a piston rod, the rear head having a first opening defining a passageway a and a second opening defining an orifice adapted to receive metering pin;

the cylinder extending between the front head and rear head to define a hydraulic chamber adapted to receive a piston;

a reservoir adjacent to the cylinder including at least one relief port enabling fluid communication the cylinder, said relief port controlled by a check valve;

a valve assembly adjacent to said rear head comprising, a valve body having an inlet opening and an outlet opening defining a passageway for fluid to flow therethrough, a lockout valve member interposed in said passageway having a valve actuator responsive to a control signal to open and close said valve member;

a piston assembly including a piston rod extending through the front head into said chamber, a piston head connected to said rod being carried in said chamber including at least one piston seal for providing sealing contact with the inner wall of said chamber, a metering pin extending from the piston head for cooperative engagement with said orifice; and,

wherein when said valve member is in an open position, said piston is movable in said chamber enabling impact protection and when said valve member is in a closed position, the pressure in the chamber prevents the piston from stroking, thereby locking the device.

25. A cushioning device for a railroad car coupler comprising:

a housing comprising a cylinder and a reservoir, the cylinder defining a piston chamber;

a piston slidably disposed within the piston chamber and dividing the piston chamber into a draft chamber and a buff chamber, the piston operably connected to the railroad car coupler;

- 5 a remotely controlled valve having a closed position that inhibits buff movement of the piston by blocking fluid flow; and
- wherein draft movement of the piston is permitted when the valve is in the closed position.